

# PATENT COOPERATION TREATY

To:

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# PCT

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing (day/month/year)	18 October 2004 (18.10.2004)
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Applicant's or agent's file reference AZ03-032WODA	FOR FURTHER ACTION See paragraph 2 below
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International application No. PCT/KR 2004/000999	International filing date (day/month/year) 30 April 2004 (30.04.2004)	Priority Date (day/month/year) 13 May 2003 (13.05.2003)
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International Patent Classification (IPC) or both national classification and IPC F04C29/00, F04C29/06, F04C15/00
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Applicant

LG ELECTRONICS INC.

1. This opinion contains indications relating to the following items:

- ☒ Cont. No. I Basis of the opinion
- ☐ Cont. No. II Priority
- ☐ Cont. No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Cont. No. IV Lack of unity of invention
- ☒ Cont. No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Cont. No. VI Certain documents cited
- ☐ Cont. No. VII Certain defects in the international application
- ☐ Cont. No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ AT <b>Austrian Patent Office</b> Dresdner Straße 87, A-1200 Vienna Facsimile No. +43 / 1 / 534 24 / 535	Authorized officer <b>HÖRZER K.</b>  Telephone No. +43 / 1 / 534 24 / 359
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**Continuation No. I**

**Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of a translation from the original language into the following language: English, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

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**Continuation No. V**

**Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims 1-50	YES
	Claims ----	NO
Inventive step (IS)	Claims 1-50	YES
	Claims ----	NO
Industrial applicability (IA)	Claims 1-50	YES
	Claims ----	NO

2. Citations and explanations:

The retrieved document US 4598559 A presents a rotary compressor with a driving shaft being rotatable clockwise and counterclockwise and having an eccentric portion of a predetermined size, a cylinder forming a predetermined inner volume, a roller installed rotatably on an outer circumference of the eccentric portion so as to contact an inner circumference of the cylinder, a vane installed elastically in the cylinder to contact the roller continuously, a first and a second bearing installed in the cylinder for supporting the driving shaft rotatably and discharge ports communicating with the fluid chamber. The suction port of the reversible rotary compressor in the document US 4598559 A is part of a reversing disk whose angular position depends on the rotation direction of the motor.

The document JP-A-63050693 refers to a rotary compressor comprising a driving shaft being rotatable clockwise and counterclockwise and having an eccentric portion of a predetermined size, a cylinder forming a predetermined inner volume, a roller installed rotatably on an outer circumference of the eccentric portion so as to contact an inner circumference of the cylinder, a vane installed elastically in the cylinder to contact the roller continuously, discharge ports communicating with the fluid chamber and compression spaces that have different volumes from each other are formed in the fluid chamber according to the rotation direction of the driving shaft so that two different compression capacities are formed. The different

compression capacities of the rotary compressor in the document JP-A-63050693 are achieved by different angular positions of the inlet and outlet ports.

In the document JP-A-61070193, a rotary compressor including a driving shaft being rotatable clockwise and counterclockwise and having an eccentric portion of a predetermined size, a cylinder forming a predetermined inner volume, a roller installed rotatably on an outer circumference of the eccentric portion so as to contact an inner circumference of the cylinder, a vane installed elastically in the cylinder to contact the roller continuously, a first and a second bearing installed in the cylinder for supporting the driving shaft rotatably, discharge ports communicating with the fluid chamber and a valve assembly having openings separated by a predetermined angle from each other is shown. The angular position of the disk valve of the rotary compressor of document JP-A-61070193 is controlled by the application of a radial projection on the disk and a groove in the corresponding bearing.

In the document US 3723024 A, a rotary compressor with a driving shaft being rotatable clockwise and counterclockwise, a cylinder forming a predetermined inner volume, a first bearing installed in the cylinder for supporting the driving shaft rotatably, discharge ports communicating with the fluid chamber and a valve assembly having an opening to selectively communicate with the suction plenum at a predetermined position of the fluid chamber according to rotation direction of the driving shaft is presented.

The retrieved document US 4702088 A refers to a rotary compressor having a driving shaft being with an eccentric portion of a predetermined size, a cylinder forming a predetermined inner volume, a roller installed rotatably on an outer circumference of the eccentric portion so as to contact an inner circumference of the cylinder, a vane installed elastically in the cylinder to contact the roller continuously, a first and a second bearing installed in the cylinder for supporting the driving shaft rotatably and discharge ports communicating with the fluid chamber. One embodiment of the rotary compressor of the document US 4702088 A has a suction plenum communicating with the fluid chamber.

Finally, the document US 4367638 discloses a rotary compressor comprising a driving shaft being rotatable clockwise and counterclockwise and having an eccentric portion of a predetermined size, a cylinder forming a predetermined inner volume, a roller installed rotatably on an outer circumference of the eccentric portion so as to contact an inner circumference of the cylinder, a vane installed elastically in the cylinder to contact the roller continuously, a bearing installed in the cylinder for supporting the driving shaft rotatably, discharge ports communicating with the fluid chamber and a valve assembly having openings separated by a predetermined angle from each other for allowing the openings to selectively communicate with the fluid pipes.

None of the documents cited above discloses the essential feature of a compression mechanism combined with a second bearing preliminarily storing the fluid to be sucked in order to achieve different compression capacities depending on the direction of rotation according to the independent claim 1.

Therefore, the features of the present independent claim 1 are regarded to be new and to involve an inventive step. Various features of the dependent claims 2-50 like circular or

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polygonal suction ports, a disk member contacting the eccentric portion of the driving shaft, a penetration hole in order to insert the driving shaft into the valve, control means for controlling the rotation angle of the valve, etc., are known from the above cited documents. In general, the combination of said known features with the new features of the independent claim 1 is considered to yield new and novel claims 2-50. The industrial applicability is given for all of the claims.

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